



# **MERC's DSM Initiatives & DSM Action Plan for Maharashtra**

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# Outline of Presentation

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- Electricity sector in Maharashtra: Background
- DSM efforts in Maharashtra: Brief background
  - MERC initiatives
  - Pilot/demonstration projects by Maharashtra distribution utilities
- MOU with CEC, CPUC and LBNL
  - MOU scope and coverage
  - Activities under MOU
- Latest Developments
- Key challenges and MERC DSM Action Plan



# Background

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- Three-Member MERC fully constituted in September 1999
- Erstwhile MSEB unbundled in June 2005 into
  - Maha GENCO
  - Maha TRANSCO
  - Maha DISCOM – supplies power to the entire State of Maharashtra except the State capital – Mumbai
  - MSEB Holding Company.
- Mumbai licensees:
  - Reliance Energy Ltd. (REL),
  - The Tata Power Company Ltd (TPC) &
  - Brihan-Mumbai Electricity Supply and Transport Undertaking (BEST)
- Mula-Pravara Electric Co-operative Society (MPECS) in Ahmednagar district – Rural Electricity Supply Agency





# Power Situation in Maharashtra

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- In areas serviced by MSEDCL:
  - Demand shortfall (except during rainy season) throughout the day
    - Peak shortage of nearly 4500MW (35-40% of peak demand)
  - Energy shortage of as much as 30%
  - 3-12 hours load shedding
- In Mumbai:
  - Peak demand of ~ 2900MW as against self generation of about 2200 MW. Have to import 700 MW of costly power
- Demand rising by about 1000MW per year in rest of Maharashtra, and by about 250 -300 MW per year in Mumbai



# Power Situation in Maharashtra

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- Not much capacity coming on stream in the next 36 months
- Given this scenario, the shortages are expected to last for at least 5 years
- Energy efficiency and Demand Side Management (DSM) emerge as immediate power shortage mitigation alternatives



# **MERC Initiatives for Fostering Energy Efficiency & DSM in the State of Maharashtra**



# Promotion of EE by MERC

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- Unlike grid connected renewable energy, no explicit mandate for EE in the Electricity Act 2003
- However, National Electricity Policy does refer to promotion of energy efficiency
- Considering large benefits and prevalent shortage situation in the State, MERC, under Section 23 of EA, has directed implementation of several initiatives to promote adoption of EC through utility demand side management (DSM) programmes





# Regulatory Directives to Utilities

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- **Order of March 2005**
  - MSEB to submit detailed DSM plan within one month
- **April/May 2005**
  - BEST, REL and TPC to undertake DSM programmes
  - All DSM related costs allowed as pass through in ARR for all licensees/distribution utilities





# Regulatory Directives to Utilities

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- **Tariff Order of April 2007**
  - Long Term power procurement plan to have proposals on energy conservation (EC) and energy efficiency (EE)
  - Directed to take up Load research on a sustained basis and as an integral part of operations
  - Directed to take up DSM initiatives on a sustained basis as an integral part of operations
  - **Reiterated that all the DSM related costs will be allowed as pass through in ARR**



# Capacity Building Initiatives

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- Established a DSM Cell Within MERC: April 2006
- Pending DSM Plan preparation, worked with utilities to plan and implement on “ad-hoc” basis, EE pilot/demonstration projects
- Commissioned a study to develop and institutionalise DSM bidding mechanism
- MOU with CPUC, CEC & LBNL to develop MERC and Utility Capacity for load research, DSM and integrated resource planning



# Load Management Directives of MERC

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- Load management directives to curb demand in view of worsening power shortages [basic philosophy: voluntary load management is better than forced load shedding]
- Order of May 2005: BEST, TPC, MSEDCL and REL
  - Load management charge of Rs. 1 (2.5 cents) per kWh if consumption above prescribed limit; and load management rebate of Rs. 0.5 (1.25 cents) per kWh if consumption below prescribed limit
  - Net amount collected as load management charge to be used for promotion and implementation of EE, EC DSM
  - *Collected about US \$ 17.5 million. This is being used to run DSM activities to date : All Activities to date funded out of this amount*





# MERC Withdraws Load Management Directives

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- Tariff Order of October 2006: REL & TPC: Steep Rise in load management Charge and load management incentive
  - Consumer protests as consumers faced hardships as their bills in some instances more than doubled.
  - Review petitions filed by industries and consumer associations:
  - Did not have sufficient time to prepare for the directive, it came as a shock
  - Lack of knowledge and awareness about why, where and how to reduce consumption
  - In response to Review Petitions, Load Management Charge Order withdrawn in December 2006
  - Utilities were asked to design and run a comprehensive consumer awareness campaign (conducted in March-June 2007)





## Tariff Reforms

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- Since its inception in August 1999, the Commission has undertaken several initiatives to encourage efficient consumption. Some of these initiatives are:
  - Time of Day tariffs for several categories
  - Power Factor incentives/penalties
  - Additional Supply Charge
  - Utilities asked to reduce costly power purchase cost by 2% through DSM
  - Higher tariffs for certain categories of consumers



# **DSM/EE/EC Pilot/Demonstration Projects**



## DSM /EE Projects by Utilities

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- REL project on street lights ( Energy saving = 4.56 million kWh per year, demand saving = 1.1 MW) , Budget = US \$ 1.11 million
- BEST Pilots for promotion of electronic ballasts and promotion of EC in high-rise building water pumping systems ( US\$ ).07 Million
- REL: preparation of DSM plan, undertaking load research, 30 energy audits and DSM bidding for 8<sup>th</sup> Khar Road feeder (US\$ 0.263 million)
- REL demonstration project for LED based traffic signals: Savings Achieved: Energy = 68-90%; Demand = 75-83%
- Feeder / Distribution transformer based DSM projects on 3 feeders through DSM bidding mechanism
- TPC demonstration project for capturing EC potential in lighting (use of T-5 fluorescent tubes + electronic ballasts as replacement for T-8 fluorescent lamps and conventional ballasts US \$ 0.024 million
- Nashik and Mumbai CFL projects by MSEDCL and REL





# DSM Projects by Utilities

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- Joint awareness campaign by 3 Mumbai utilities during March-June 2007
- Main Theme: “I Will Mumbai Will” – Keep Mumbai Powerfull
- Mass Media:
  - Outdoor hoardings
  - Suburban trains, train stations, Bus panels, Bus shelters
  - Newspapers
  - Radio: Dedicated programmes and Radio spots
  - Cinema: 1 minute film was screened in select cinema theatres
- Schools: Activities designed to ensure children participation
- Activation Programmes at:
  - 4 malls & 60 traffic signals
  - Messages through Mumbai’s famous “Dabbawallas”
  - Skits in select establishments
  - CEO mailers with kits
  - Mobile Demo House.
- US \$ 1.25 million was spent





# **MOU with CPUC, CEC and LBNL**



# MOU Scope and Coverage

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- MOU Scope:
  - Energy Efficiency and Demand Side Management policies
  - Regulatory policies for renewable energy development
  - Integrated Resource Planning
  - Electricity Regulation and Governance
  - Transmission pricing framework
  - Balancing market framework in Maharashtra
  - Market development through Open Access and Consumer Choice
- These activities and cooperation will be developed through:
  - Exchange of information mainly data and publications
  - Visit and exchanges of researchers/experts
  - Joint seminars, conferences and workshops on energy issues which are of common interests to both parties
  - Implementing future collaborative research projects.



# MOU Scope, Coverage and Benefits

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- **Benefits:**
- Enhancement of capacity of the State distribution utilities in the areas including but not limited to load research, power procurement planning, demand side management programmes and integrated resource planning.
- Enhanced understanding of electricity regulations and governance
- Increased understanding of practices and tools being used in California which could be most appropriate for Maharashtra State.



# MOU Events & Activities

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- Completed Events:
  - Scoping workshop to scope out the 1<sup>st</sup> year work
    - Held in Mumbai 11-12 December 2007
    - 35 participants from utilities, EE/DSM consultants participated
  - Seminar on Demand Response
    - Held in Mumbai on 22<sup>d</sup> January 2008
    - 15 participants from utilities
  - Training program on Basics of IRP, Load Research and DSM
    - Held in Mumbai; 14-18 March 2008
    - 25 participants from utilities and consultants





# MOU Events & Activities

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- Next **Possible** Steps

- Assistance to MERC

- In developing guidelines for:
      - Evaluating cost effectiveness of DSM programs
      - Evaluation, monitoring and verification
      - General policy on DSM
    - In conducting efficiency potential studies
    - In conducting demand forecasting and resource planning studies

- Assistance to Utilities

- Proposed DSM and M&V Plans being prepared
    - Proposed load research and IRP exercises being undertaken
    - Undertake case studies in DSM
    - Familiarizing utilities in DSM program administration and implementation models
    - Demand Response (DR) Potential studies, designing a pilot DR program



# Latest Developments



# Latest Developments

- Provided for DSM expenditure through approval of DSM Budgets so that resources are available for DSM activities
- Systematic introduction of DSM in utilities:
  - DSM Cells being established with dedicated resources and staff
  - DSM plan preparation and load research being undertaken – consultants appointed by REL and TATA Power
- While systematic plans being developed, moves to take-up “quick-win” DSM in following areas:
  - Domestic appliances (refrigerators & air-conditioners by REL)
  - Feeder based agriculture DSM in separated agriculture feeders (MSEDCL)
  - Feeder based rural domestic sector DSM in single phase or separated rural domestic feeders (MSEDCL)
  - DSM for Municipal Bodies in pumps and street lighting (MSEDCL, REL, TATA)
  - DSM in office buildings (MUMBAI UTILITIES – Difference in load between Sunday and Other days is 1000 MW, most load is AC, lighting and pumping)
  - DSM in Industrial estates (cluster based DSM) such as MIDC estates



# Approval of DSM Budgets for 2008-09

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- REL:
  - Amount = US \$ 5.9 million
  - Funding: US \$ 3.4 million from ARR; US \$ 2.5 million from LMC
  - Status: Approved
- TATA Power
  - Amount = US \$ 1.89 million
  - Funding = US \$ 0.96 million from ARR; US \$ 0.93 million from LMC
  - Status: Approved
- MSEDCL:
  - Amount = US \$ 9 million
  - Funding: All from LMC
  - Status: Proposed





# Approval of DSM Budgets for 2008-09

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- BEST
  - Amount = US \$ 1.8 million
  - Funding = All from LMC
  - Status: Proposed
- In general, the budgets cover:
  - Resources for establishment and running of dedicated DSM Cells
  - Training and development of personnel
  - Undertaking of research and other studies
  - Preparation of DSM Plans
  - Initiation of load research
  - Procurement of equipments, meters, data loggers, software
  - DSM program design and implementation



# **Key Challenges & MERC Action Plan**



# Key Challenges

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- Immediate challenges:
  - **Development of Database for base line estimation**
  - **Guidelines for DSM regulatory process – DSM program submission, appraisal, approval, planning cycle, preparation and approval of yearly OR 3 yearly DSM budgets, etc.**
  - **Guidelines for economic evaluation of DSM programs**
  - **Guidelines for M&V**
  - **Estimation of DSM potential in various sectors, segments, end-uses, etc.**
  - **Building utility competencies – institutionalisation of DSM, IRP and load research**
  - **Developing appropriate incentives for utilities to take up DSM and EE/EC under cost plus regulatory regime within the ambit of EA 2003**





# Key Challenges Contd.....

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## – Absence of energy efficiency market:

- How to raise resources for implementing DSM program
- How to motivate bankers/financiers to lend for energy efficiency projects
- Delivery of energy efficiency : there are hardly any ESCOs, consultants, vendors to deliver energy efficiency (to plan as well as to implement DSM/EE/EC programmes and projects)



# MERC DSM Action Plan

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- Strengthening of MERC DSM Cell for DSM program appraisal
- Develop Guidelines for/regarding:
  - DSM planning cycle, submission of budgets, DSM program/portfolio approval process
  - Submission of DSM program/DSM program portfolio
  - Appraisal of DSM programs, including economic evaluation and multiple-program appraisal criteria (merit order ranking of DSM portfolio)
  - M&V and evaluation of DSM programs
  - Incentivization of utilities to take up DSM under cost plus regime
- DSM website development and management
- Establishing DSM steering Committee and DSM working group (utility personnel as members) to better coordinate DSM activities



# MERC DSM Action Plan

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- Undertaking studies on specific topics of interest
  - DSM potential determination studies
  - Imposition of “cess” on electricity consumption for funding DSM, Such “cess” is already being charged in three Indian States of Haryana, Chattisgarh and Uttarakhand
  - Development of M&V protocols for;
    - Feeder based agriculture DSM
    - Feeder based rural domestic sector DSM
    - Municipal DSM
    - Building DSM programs
  - Impact analysis studies to study the impact of tariff initiatives such as TOD tariff, higher tariff for hoardings and displays, higher tariffs for certain categories of consumers





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THANK YOU